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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NAFF, DAVID M

ART UNIT	PAPER NUMBER
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1651

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/088,412

Applicant(s)

MARKL ET AL.

Examiner

David M. Naff

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 39-50, 52-70, 81, 82 and 84-92 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39-50, 52-70, 81, 82 and 84-92 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

A response of 6/12/06 presented arguments and did not amend the claims.

Claims examined on the merits are 39-50, 52-70, 81, 82 and 84-92,  
5 which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 112***

Claim 70 is rejected under 35 U.S.C. 112, first paragraph, as  
10 failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

15 As set forth in the previous office action of 4/11/06, support is not found in the specification for the dialysis membrane having internal spaces and a gas outlet in an internal space as required by the claim.

***Response to Arguments***

20 Applicants urge that support for a membrane module having internal spaces and a gas outlet in an internal space is supported in the specification at page 5, lines 27-35, page 6, lines 1-9, and Figure 3 as described on page 12, lines 20-36. However, the claim is not requiring a module having internal spaces and an outlet in one of  
25 the internal spaces, but instead is requiring a module comprising a

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dialysis membrane having internal spaces and a gas outlet in one of the spaces. This is nowhere described in the sections of the specification cited for support by applicants. Additionally, the sections of specification cited for support do not describe a module  
5 having internal spaces and an outlet in one of the spaces in combination with two spaces separated by a membrane as required by claim 70. Claim 70 is requiring a membrane module not described or supported in the specification.

***Claim Rejections - 35 USC § 112***

10        Claims 45 and 70 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention for reasons set forth in the previous office action.

      Claim 45 is unclear as amended by requiring supplying the  
15 dialysis fluid space or the culture fluid space with the second gas since in claim 39, the second gas is required to be introduced in the culture fluid space in the module. Therefore, the second gas cannot be introduced only in the dialysis fluid space as encompassed by the alternative now required by claim 45.

20        Amending claim 70 to require a dialysis membrane "having internal spaces", and a gas outlet in one of the internal spaces is uncertain as to the structure of a membrane with internal spaces, and an internal space containing an outlet. Membranes are normally thin, and it is not seen how the membrane can contain internal spaces, and an  
25 internal space large enough to contain a gas outlet.

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***Response to Arguments***

Applicants urge that claim 45 recites "directly introducing the second gas", which is supported at page 8, lines 1-34, of the specification. However, claim 45 requires more than "directly" introducing, but also requires introducing the second gas into the dialysis fluid space or the culture fluid space or both. Claim 39 on which claim 45 depends requires introducing the second gas into the culture fluid space. This precludes the alternatives of claim 45 since a dependent claim cannot broaden a previous claim on which it depends. A dependent claim must further limit a previous claim.

In regard to claim 70, applicants urge that in one embodiment of the invention the membrane has the shape of a tube, and for its volume to form one of the two spaces of the membrane module. However, claim 70 is not requiring the membrane to be in the form of a tube, but encompasses something quite different from a tube.

***Claim Rejections - 35 USC § 103***

Claims 39-50, 52-70, 81, 82 and 84-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Portner et al (listed on form PTO-1449) for reasons in the previous office action and for reason herein.

The claims are drawn to a method for culturing cells using a reaction system and to a reaction system for carrying out the method wherein the reaction system contains a container for dialysis fluid and a culture vessel for culturing cells and a membrane module in fluid communication with the container and vessel. The module

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contains two spaces separated by a dialysis membrane. Dialysis fluid is circulated through one of the two spaces and culture fluid is circulated through the other space. A first gas is introduced into the vessel for culturing cells, and a second gas is introduced into culture fluid space in the membrane module. Also claimed is the membrane module along with a gas supply means to supply gas to one of the spaces.

Portner et al disclose (Figure 2a, page 405) a reaction system as required by the present claims except for supplying gas to culture fluid in the dialysis module (membrane module). Portner et al disclose (page 404, right col, 3<sup>rd</sup> complete paragraph) that when cells are pumped through the external module, the cells can suffer from oxygen limitation. Figure 3a (page 406) discloses a reactor without an external module where a culture chamber is separated from a dialyzing chamber by a dialysis membrane. Air is supplied to the culture chamber. In Figure 3b, air is supplied to the dialyzing chamber.

It would have been obvious to supply air to space containing circulating culture liquid containing cells in the dialysis module of the reactor of Figure 2a of Portner et al to prevent cells from suffering oxygen limitation as disclosed on page 404 since it would have been apparent from Figure 3a that oxygen can be supplied to cells in a chamber separated from a dialyzing chamber by a dialysis membrane. The conditions of dependent claims not disclosed by Portner et al are conditions that would be expected to require control when

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using the reaction system of Portner et al, and such conditions would have been matters of optimization depending on individual preference well within the skill of the art. Providing air to the dialyzing chamber as required by certain claims would have been suggested by  
5 Figure 3b of Portner et al.

***Response to Arguments***

Applicant's arguments filed 6/12/06 have been fully considered but they are not persuasive.

Applicants urge that they are not aware of any dialysis module on  
10 the market that is equipped with means to supply air to cells.  
However, such a dialysis module would have been obvious from Portner et al disclosing supplying air to cells in culture fluid in contact with a dialysis membrane in Fig 3a. There is seen nothing to lead one to believe air cannot be supplied to cells in culture fluid in the  
15 dialysis module of Fig 2a analogous to supplying air to cells in culture fluid in contact with a dialysis membrane in Fig 3a. Portner et al disclose the problem that suspended cells can suffer from oxygen limitation when pumped through the external module. Supplying oxygen to cells in the module would have been clearly an obvious way of  
20 overcoming the oxygen limitation problem since Fig 3a shows supplying oxygen to cells on one side of a dialysis membrane.

Applicants urge that standard dialysis modules contain tubes with an inner diameter of 1 mm or smaller that would not provide space to insert means for supplying gas to cells. However, it would have been

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apparent from Figure 3 of Portner et al that tubes of this size are not required for a dialysis module.

Applicants urge that enough oxygen cannot be supplied to cells via the membrane. However, Portner et al, in Figures 2 and 3, is not  
5 supplying air via the membrane, but is supplying air via a tube.

Applicants urge that *prima facie* obviousness does not exist without some reason to make the modification. However, the problem that suspended cells can suffer from oxygen limitation when pumped through the external module as disclosed by Portner et al would have  
10 been a reason to make the modification presently claimed.

#### **Conclusion**

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is  
15 set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action  
20 is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier  
25 communications from the examiner should be directed to David M. Naff



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whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David M. Naff  
Primary Examiner  
Art Unit 1651